

Amendments to the Claims

1-39. (Canceled)

40. (Currently Amended) A method of using a holographic reticle to characterize an optical system, the method comprising the steps of:

- (1) configuring the optical system such that a first plane containing the holographic reticle is positioned obliquely to a second plane where ~~the an~~ image is recorded;
- (2) placing the holographic reticle in a path of an optical beam within the optical system; and
- (3) recording ~~an~~ the image produced by the optical beam passing through the holographic reticle; and
- (4) ~~analyzing the image to characterize the optical system for at least one of field curvature, astigmatism, coma, distortion, telecentricity, spherical aberrations, and variation of coherence.~~

wherein the image is configured to characterize the optical system for at least one of field curvature, astigmatism, coma, distortion, telecentricity, spherical aberrations, and variation of coherence.

41. (Original) The method of claim 40, wherein the holographic reticle has a plurality of feature sets thereon.

42. (Original) The method of claim 41, wherein the plurality of feature sets includes at least one of a periodic pattern and a grating pattern.

43. (Original) The method of claim 40, wherein the second plane is positioned in a volume of space that includes a depth of focus of the optical system.

44. (Previously Presented) The method of claim 40, wherein step (3) comprises:
recording the image produced by the optical beam passing through the holographic reticle in a recording medium.

45. (Currently Amended) The method of claim ~~61~~ 44, wherein the recording medium is a photo-sensitive substrate.

46. (Currently Amended) The method of claim 40, wherein ~~step (4) comprises:~~
~~analyzing the image to extract includes information indicative of~~ a feature image shift.

47. (Currently Amended) The method of claim 40, wherein ~~step (4) (3) comprises:~~
~~analyzing recording the image produced by the optical beam passing through the holographic reticle in real time using a demodulating device to characterize the optical system. device.~~

48. (Currently Amended) The method of claim 40, wherein ~~step (4) comprises:~~
~~analyzing the image to extract includes information indicative of~~ a Zernike aberration.

49. (Currently Amended) A The method of using a holographic reticle to characterize an optical system, the method comprising the steps of: claim 40, further comprising the step of:

- (1) configuring the optical system such that a first plane containing the reticle is positioned obliquely to a second plane where the image is recorded;
- (2) placing the holographic reticle in a path of an optical beam within the optical system;
- (3) recording an image produced by the optical beam passing through the holographic reticle; and
- (4) analyzing the image interferometrically to produce producing an interferogram having one or more tilts and one or more pistons that represent at least one optical parameter of the optical system.

50. (Currently Amended) The method of claim 49, further comprising the steps of: wherein the interferogram includes information based on the one or more pistons indicative of an image shift and information based on the one or more tilts indicative of magnification parameters.

- (a) detecting an image shift based on said pistons; and
- (b) detecting magnification parameters based on said tilts.

51. (Currently Amended) The method of claim 50, further comprising the step of: 49, wherein the interferogram includes information based on the one or more pistons and the one or more tilts indicative of non-uniform distortion parameters.

- (c) detecting non-uniform distortion parameters based on said pistons and tilts.

52. (Currently Amended) The method of claim 51, wherein said the non-uniform distortion parameters are detected as a function of a variation in linewidth.

53. (Currently Amended) The method of claim 51, wherein said the non-uniform distortion parameters are detected from a non-linear phase front of a chirped grating structure.

54. (Currently Amended) The method of claim 40, wherein ~~step (4) comprises:~~
~~comparing the image with another recorded image to deconvolve includes information indicative of higher order aberrations in the optical system from lower order aberrations.~~
system.

55. (Currently Amended) The method of claim 54, wherein ~~said comparing step further comprises:~~
~~determining the relative the image includes information indicative of shift differences due to the different partial coherence conditions of the recorded images.~~ conditions.

56. (Previously Presented) The method of claim 40, wherein the holographic reticle includes a pattern of linewidths such that each linewidth is an integral multiple of a fundamental linewidth.

57. (Currently Amended) The method of claim 56, wherein step (3) comprises:

analyzing the image for includes information indicative of relative image shifts at a single interferometric angle.

58-64. (Canceled)

The listing of claims will replace all prior versions, and listings of claims in the application.